



# LoTi Digital-Age Profile

**Organization:**  
Manheim Township  
Middle School

**Participants:**  
59

**Data Collected:**  
*Jul 01, 2010*  
through  
*Jun 30, 2011*

# Introduction



ENGAGED STUDENT LEARNING



REAL-WORLD PROBLEM SOLVING

Today, LoTi as Levels of Teaching Innovation represents the transformation from didactic teaching practices and student compliant learning to digital-age teaching and learning characterized by the use of digital tools and resources to promote higher order cognitive processing, engaged student learning, and authentic, real-world problem-solving. The acronym, LoTi, is similar to other international school improvement efforts to improve student achievement and classroom pedagogy employing research-based best practices, but differs in its fundamental approach-an approach that uses digital-age literacy (e.g., learning-centered instruction, real-world problem-solving, collaborative learning environments) to achieve targeted outcomes impacting student success in the classroom.



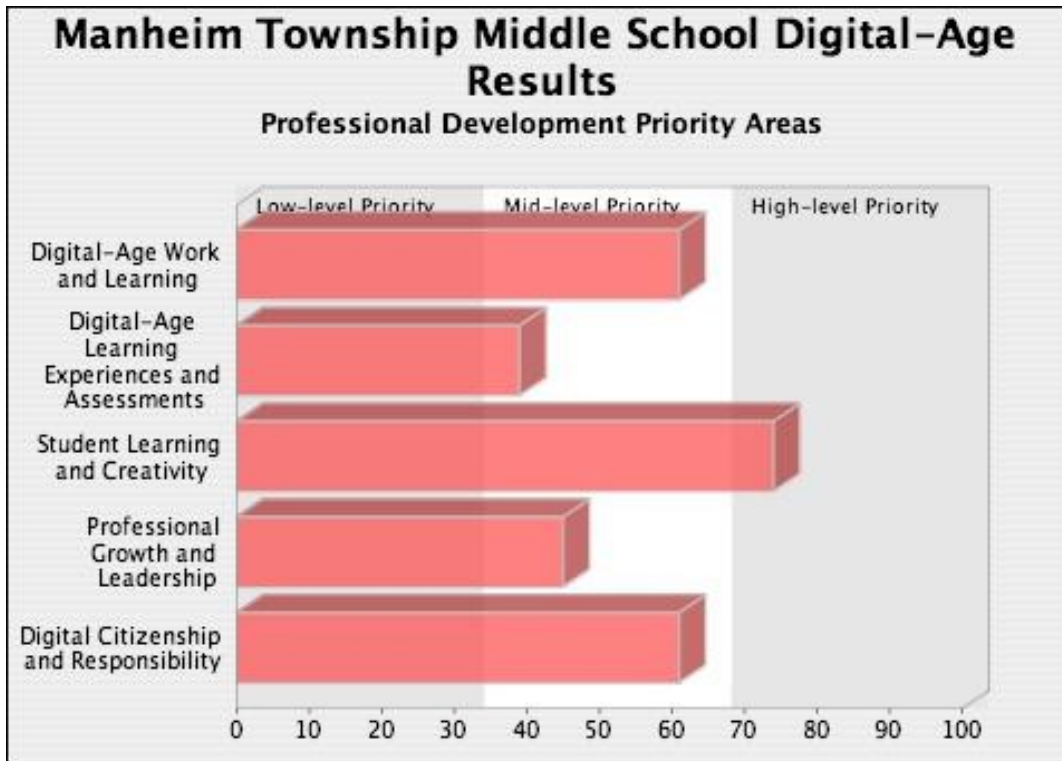
Your organization recently conducted a digital age profile to ascertain each participant's current level of teaching innovation using the LoTi Digital-Age Survey. This instrument measures three critical components pivotal to digital-age literacy and innovative teaching practices: LoTi (Levels of Teaching Innovation), PCU (Personal Computer Use), and CIP (Current Instructional Practices). The LoTi Digital-Age Survey focuses on teacher behaviors, perceptions, and instructional practices using digital tools and resources which collectively have the greatest impact on student achievement and success in the classroom. Such information will enable school systems to target funding sources and provide differentiated professional development opportunities directed at moving participants to a higher level of teaching innovation in the classroom, and in doing so, better prepare students for the challenges facing them in a highly competitive, Digital-Age society.

The LoTi Digital-Age Survey generated a profile for each participant in three domains: Levels of Teaching Innovation (LoTi), Personal Computer Use (PCU), and Current Instructional Practices (CIP). The Levels of Teaching Innovation (LoTi) profile approximates the degree to which each participant either supports or implements the tenets of digital age teaching and learning in a classroom setting. The Personal Computer Use (PCU) profile addresses

each participant's fluency level with digital tools and resources for student learning as well as their use in the workplace. The Current Instructional Practices (CIP) profile reveals each participant's support for or implementation of instructional practices consistent with a learner-based curriculum design (e.g., learning materials determined by the problem areas under investigation, multiple assessment strategies integrated authentically throughout the curriculum, teacher as co-learner/facilitator, focus on learner-based questions) and research-based best practices.

The LoTi Digital-Age Survey also generated a customized professional development priority profile for each participant as well as for your school system based on the LoTi Digital-Age Priority Areas aligned to the ISTE National Educational Technology Standards for Teachers (NETS-T). (See Appendix A.) This profile identifies priority areas for professional development in five specific categories aligned to the NETS-T: Digital-Age Work and Learning; Digital-Age Learning Experiences and Assessments; Student Learning and Creativity; Professional Growth and Leadership; and Digital Citizenship and Responsibility. The resulting profile, in essence, represents a personalized professional development growth plan for each individual as well as for your school system targeting Digital-Age literacy, classroom pedagogy, and student achievement.

# LoTi Digital-Age Priorities



## The LoTi Digital-Age

Priorities focus on the delicate balance between instruction, assessment, and the effective use of digital tools and resources to promote 21st Century teaching and learning.

## Digital-Age Priority: Professional Growth and Leadership

Professional Growth and Leadership was determined to have the highest-level need for professional development while Digital-Age Learning Experiences and Assessments was determined to have the lowest-level need for professional development. It is highly recommended that staff development planners use the data from the five empirically-validated LoTi Digital-Age Priority Areas to offer professional development onsite and online via courses, workshops, seminars, and/or mentoring opportunities that address the highest priority areas identified.

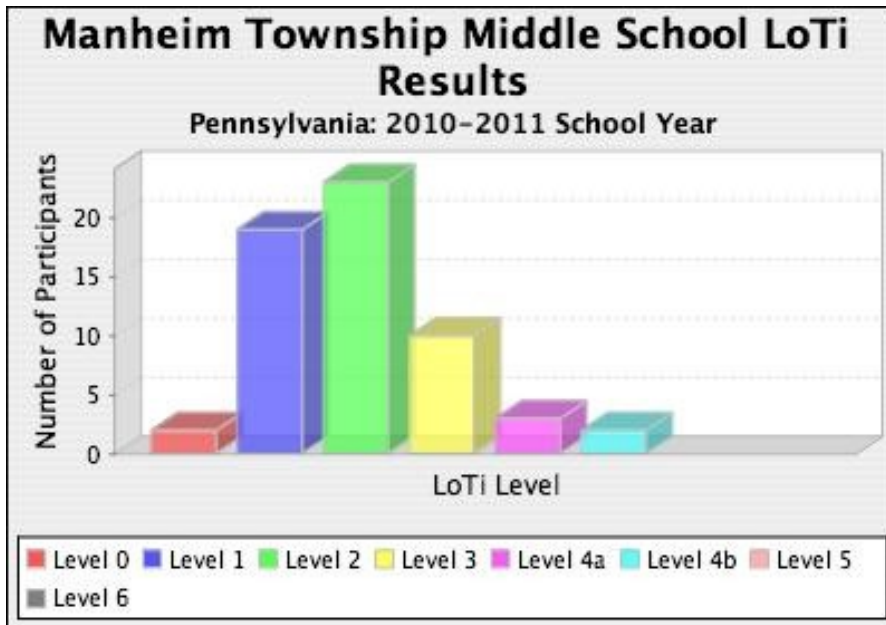
As you review the individual priorities for professional development, it is recommended that your school, district, or region align existing professional development offerings (e.g., courses, seminars, webinars, mentoring opportunities, workshops) with the specific LoTi Digital-Age Priority Areas. These categories are aligned directly to ISTE's National Educational Technology Standards for Teachers (NETS-T) and have been empirically-validated to provide school systems with a road map to close the achievement gap, promote Digital-Age literacy, and elevate the overall level of teaching innovation in the classroom. This process will enable classroom teachers to make a connection between their individual LoTi Digital-Age Profile and staff development opportunities provided by your school system.



LoTi Digital-Age Priority	LoTi Digital-Age Priority Level Description
Digital-Age Work and Learning	According to the National Education Technology Standards for Teachers (NETS-T) from ISTE, Digital-Age Work and Learning signifies a teacher's exhibition of the "knowledge, skills, and work processes representative of an innovative professional in a global and digital society." Based on this priority area, a teacher is able to demonstrate fluency in a variety of technology systems, communicate relevant information and collaborate with others (e.g., students, parents, community members) using a variety of digital tools and resources, and employ current and emerging technologies for data analysis purposes in support of research and learning.
Digital-Age Learning Experiences and Assessments	According to the National Education Technology Standards for Teachers (NETS-T) from ISTE, Digital-Age Learning Experiences and Assessments signifies a teacher's ability to "design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning...." Based on this priority area, a teacher is able to create and implement engaging and relevant learning experiences that incorporate a variety of digital tools and resources, promote learner-based investigations, and provide a myriad of formative and summative assessment schemes aligned to the content and technology standards to improve and adjust future learning experiences.
Student Learning and Creativity	According to the National Education Technology Standards for Teachers (NETS-T) from ISTE, Student Learning and Creativity signifies a teacher's ability to "use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments." Based on this priority area, a teacher is able to promote, support, and model creative and innovative thinking; engage students in real-world problem-solving and issues resolution; model collaborative learning communities; and support student reflection using a variety of collaborative tools and resources.
Professional Growth and Leadership	According to the National Education Technology Standards for Teachers (NETS-T) from ISTE, Professional Growth and Leadership signifies a teacher's inclination to "continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources." Based on this priority area, a teacher is able to participate in local and global learning communities, evaluate and reflect on current research and professional practice involving the use of digital tools and resources, and exercise leadership in promoting the technology skills of others as well as improvements to the teaching profession.
Digital Citizenship and Responsibility	According to the National Education Technology Standards for Teachers (NETS-T) from ISTE, Digital Citizenship and Responsibility signifies a teacher's understanding of the "local and global societal issues and responsibilities in an evolving digital culture and (the ability to) exhibit legal and ethical behavior in their professional practice." Based on this priority area, a teacher is able to to advocate, model, and teach safe, legal, and ethical use of digital information and technology; employ learner-centered strategies to address the diverse needs of all learners; promote and model digital etiquette; and promote Digital-Age communication and collaboration tools with diverse groups and cultures.



# LoTi Profile



LoTi  
2

## The Levels of

## Teaching Innovation

## (LoTi) Profile

approximates the

degree to which

each participant is

either supporting or

implementing the

tenets of digital-age

teaching and learning

in a classroom

setting.

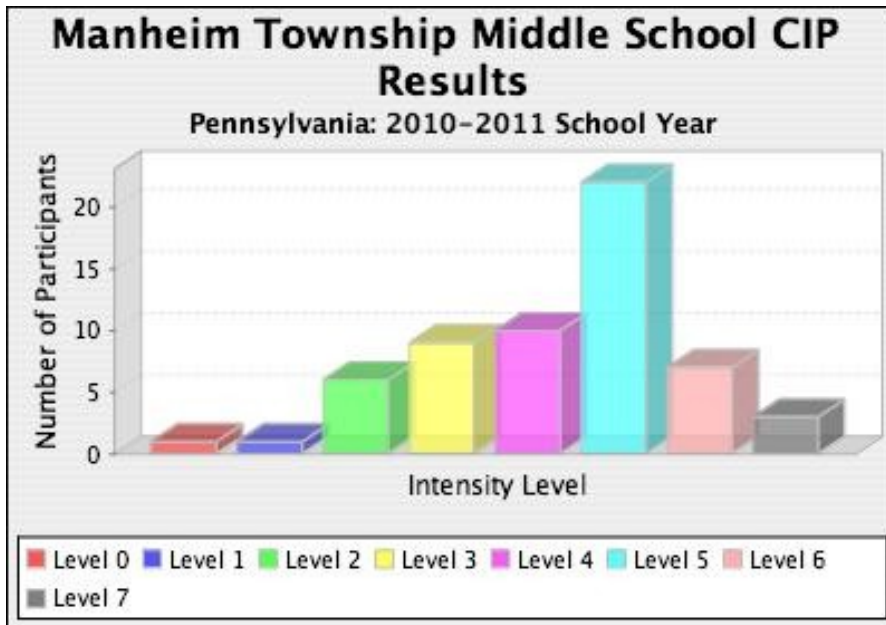
## LoTi Level 2: Exploration

At a Level 2 (Exploration) the instructional focus emphasizes content understanding and supports mastery learning and direct instruction. Teacher questioning and/or student learning focuses on lower levels of student cognitive processing (e.g., knowledge, comprehension) using the available digital assets.



LoTi Level	Description	Percent of Participants	Number of Participants
Level 0: Non-use	Instructional focus may vary; digital tools and resources are not used during the instructional day.	0 %	0
Level 1: Awareness	Instructional focus emphasizes information dissemination; teachers use digital tools and resources for classroom management tasks or instructional presentations.	0 %	0
Level 2: Exploration	Instructional focus emphasizes content understanding; students use digital tools and resources to generate multimedia products that showcase content understanding.	0 %	
Level 3: Infusion	Instructional focus emphasizes engaged higher order learning; students use digital tools and resources to solve teacher-directed problems related to the content under investigation.	100 %	1
Level 4a: Integration	<p>Instructional focus emphasizes student-directed exploration of real-world issues; students use digital tools and resources to answer self-generated questions that dictate the content, process, and product.</p> <p>Level 4a teachers experience classroom management or climate issues that restrict full-scale integration.</p>	0 %	0
Level 4b: Integration (Routine)	<p>Instructional focus emphasizes student-directed exploration of real-world issues; students use digital tools and resources to answer self-generated questions that dictate the content, process, and product.</p> <p>Level 4b teachers facilitate full-scale inquiry-based teaching regularly with minimal implementation issues.</p>	0 %	0
Level 5: Expansion	Instructional focus emphasizes global student collaboration to solve world issues; students use digital tools and resources for authentic problem-solving opportunities beyond the classroom.	0 %	0
Level 6: Refinement	Instructional focus is entirely learner-based; students experience seamless integration of digital tools and resources for their self-directed problem solving and issues resolution.	0 %	0

# CIP Profile



CIP  
5

## The Current

## Instructional

## Practices (CIP)

## Profile reveals

## each participant's

## support for or

## implementation

## of instructional

## practices consistent

## with a learner-based

## curriculum design

## and research-based

## best practices.

## CIP Intensity Level 5

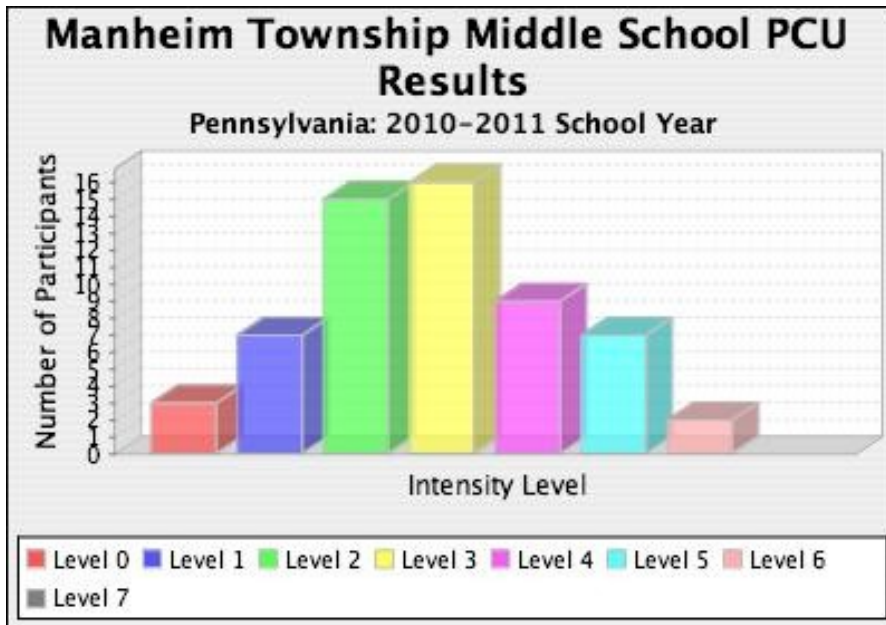
At a CIP Intensity Level 5, the participant's instructional practices tend to lean more toward a learner-based approach. The essential content embedded in the standards emerges based on students "need to know" as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills. The types of learning activities and teaching strategies used in the learning environment are diversified and driven by student questions. Both students and teachers are involved in devising appropriate assessment instruments (e.g., performance-based, journals, peer reviews, self-reflections) by which student performance will be assessed.





CIP Level	Description	Percent of Participants	Number of Participants
CIP Intensity Level 0	No formal classroom setting.	0 %	0
CIP Intensity Level 1	Instructional practices align exclusively with a subject-matter based approach to teaching and learning; teaching strategies lean toward lectures and/or teacher-led presentations.	0 %	0
CIP Intensity Level 2	Instructional practices still consistent with a subject-matter based approach to teaching and learning; emphasis on didactic instruction and teacher-generated questions.	0 %	0
CIP Intensity Level 3	Instructional practices align somewhat with a subject-matter based approach to teaching and learning with limited options given to students for their final products.	0 %	0
CIP Intensity Level 4	Instructional practices align with a subject-matter based approach to teaching and learning, but students are given expanded options with the content, process, and/or products.	0 %	0
CIP Intensity Level 5	Instructional practices lean toward a learner-based approach; teaching strategies and assessments used for learning are diversified and driven by student questions.	0 %	0
CIP Intensity Level 6	Instructional practices consistent with a learner-based approach; student inquiry and self-directed problem solving influence the content and context of instruction.	100 %	1
CIP Intensity Level 7	Instructional practices align exclusively with a learner-based approach to teaching and learning; students establish personal goals and monitor their own pace and progress with a purposeful learning space.	0 %	0

# PCU Profile



PCU  
3

## The Personal

### Computer Use (PCU)

#### Profile addresses

#### each participant's

#### fluency level with

#### digital tools and

#### resources for student

#### learning as well

#### as their use in the

#### workplace.

## PCU Intensity Level 3

A PCU Intensity Level 3 indicates that the participant demonstrates moderate fluency with using digital tools and resources for student learning. Participants at Intensity Level 3 may begin to become "regular" users of selected digital-age media and formats (e.g., internet, email, word processor, multimedia) to (1) communicate with students, parents, and peers and (2) model their use in the classroom in support of research and learning. Participants at this level are aware of copyright issues and maintain a moderate understanding of the impact of existing and emerging digital tools and resources on student learning.

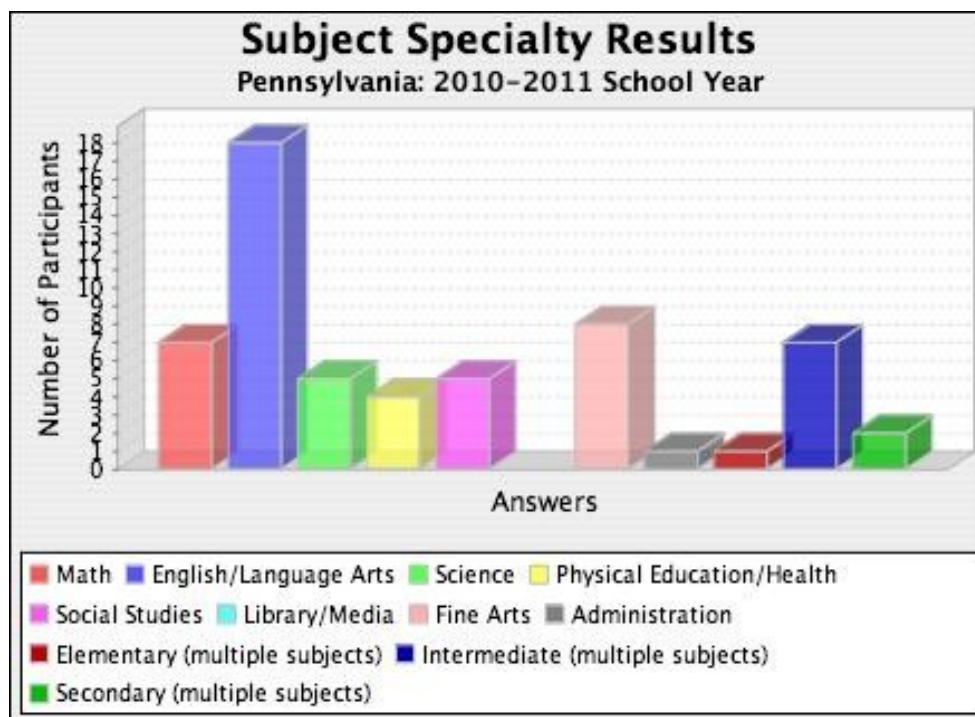


PCU Level	Description	Percent of Participants	Number of Participants
PCU Intensity Level 0	No Inclination or skill level to use digital tools and resources for either personal or professional use.	0 %	0
PCU Intensity Level 1	Little fluency with using digital tools and resources for student learning; may have a general awareness of various digital tools and media but is not using them.	0 %	0
PCU Intensity Level 2	Little to moderate fluency with using digital tools and resources for student learning; does not feel comfortable using digital tools/resources beyond classroom management.	0 %	0
PCU Intensity Level 3	Moderate fluency with using digital tools and resources for student learning; may begin to become "regular" user of selected digital-age media and formats.	0 %	0
PCU Intensity Level 4	Moderate to high fluency with using digital tools and resources for student learning; commonly uses a broader range of digital-age media and formats in support of curriculum.	100 %	1
PCU Intensity Level 5	High fluency level with using digital tools and resources for student learning; commonly able to expand range of emerging digital-age media and formats in support of curriculum.	0 %	0
PCU Intensity Level 6	High to extremely high fluency level with using digital tools and resources for student learning; sophisticated in the use of most existing and emerging digital-age media or format.	0 %	0
PCU Intensity Level 7	Extremely high fluency level with using digital tools and resources for student learning; sophisticated in the use of any existing and emerging digital-age media or format.	0 %	0

# Subject/Specialty



Demographic  
profile questions  
provide additional  
information that  
can aid stakeholders  
in determining  
appropriate  
professional  
development goals  
for staff.



## Demographic Profile: Subject Specialty

*Which category best describes your primary subject/specialty?*

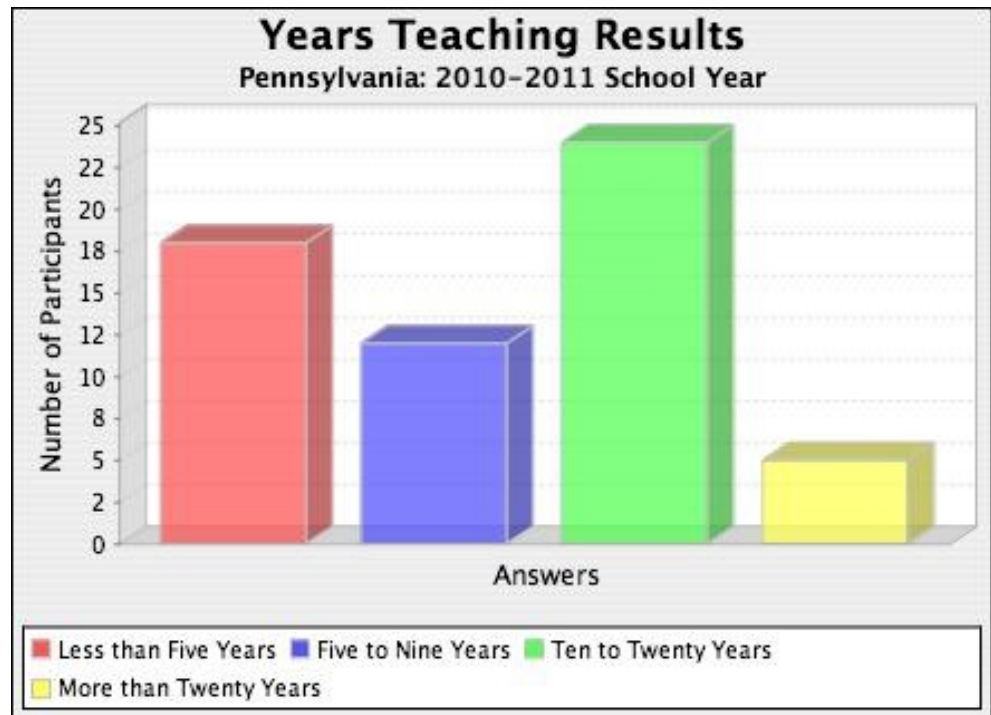
Response	Percent of Participants	Number of Participants
Math	12%	7
English/Language Arts	31%	18
Science	9%	5
Physical Education/Health	7%	4
Social Studies	9%	5
Library/Media	less than 1%	0
Fine Arts	14%	8
Administration	2%	1
Elementary (multiple subjects)	2%	1
Intermediate (multiple subjects)	12%	7

*58 out of 59 participants responded to this question.*



# Years Teaching

Demographic  
profile questions  
provide additional  
information that  
can aid stakeholders  
in determining  
appropriate  
professional  
development goals  
for staff.



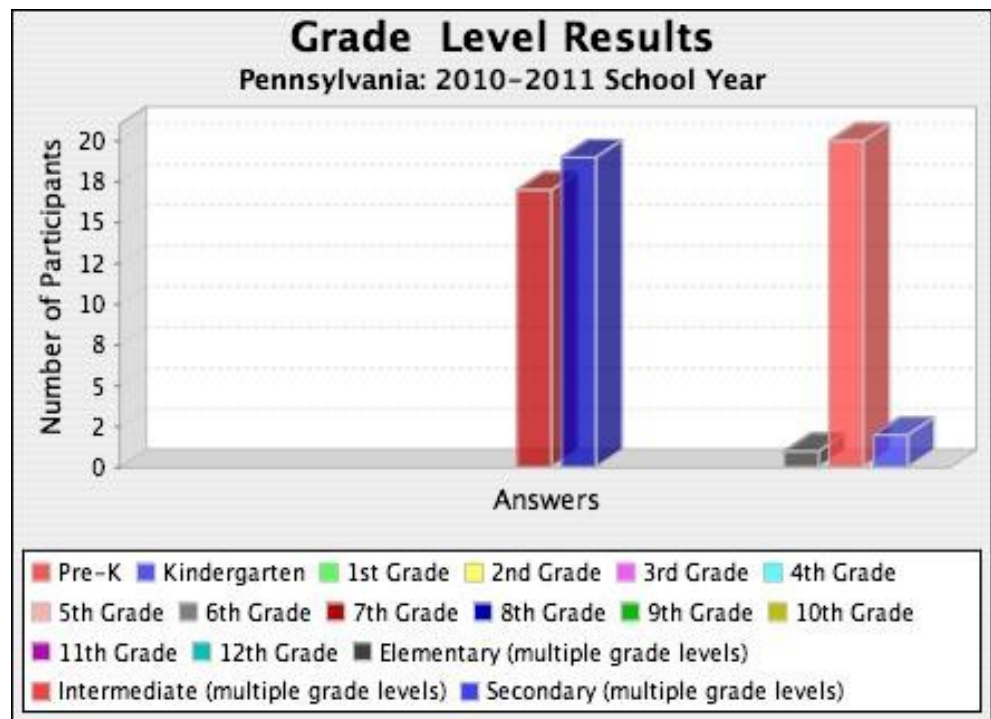
## Demographic Profile: Years Teaching

*How many years of experience do you have in education?*

Response	Percent of Participants	Number of Participants
Less than Five Years	31%	18
Five to Nine Years	20%	12
Ten to Twenty Years	41%	24
More than Twenty Years	8%	5

*59 out of 59 participants responded to this question.*

Demographic  
profile questions  
provide additional  
information that  
can aid stakeholders  
in determining  
appropriate  
professional  
development goals  
for staff.



## Demographic Profile: Grade Level

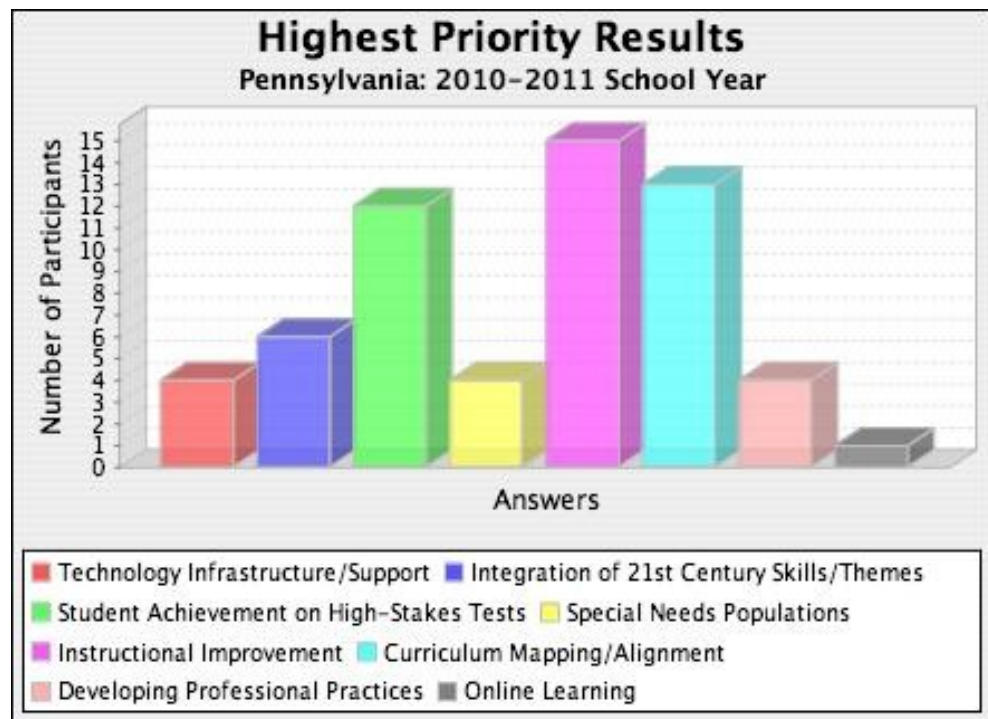
*Which category best describes your primary grade level?*

Response	Percent of Participants	Number of Participants
Pre-K	less than 1%	0
Kindergarten	less than 1%	0
1st Grade	less than 1%	0
2nd Grade	less than 1%	0
3rd Grade	less than 1%	0
4th Grade	less than 1%	0
5th Grade	less than 1%	0
6th Grade	less than 1%	0
7th Grade	29%	17
8th Grade	32%	19
9th Grade	less than 1%	0
10th Grade	less than 1%	0
11th Grade	less than 1%	0
12th Grade	less than 1%	0
Elementary (multiple grade levels)	2%	1

Intermediate (multiple grade levels)	34%	20
Secondary (multiple grade levels)	3%	2

*59 out of 59 participants responded to this question.*

Demographic  
profile questions  
provide additional  
information that  
can aid stakeholders  
in determining  
appropriate  
professional  
development goals  
for staff.



## Demographic Profile: Highest Priority

*What do you see as your school system's highest priority in the upcoming school year?*

Response	Percent of Participants	Number of Participants
Technology Infrastructure/Support	7%	4
Integration of 21st Century Skills/Themes	10%	6
Student Achievement on High-Stakes Tests	20%	12
Special Needs Populations	7%	4
Instructional Improvement	25%	15
Curriculum Mapping/Alignment	22%	13
Developing Professional Practices	7%	4
Online Learning	2%	1

*59 out of 59 participants responded to this question.*

# LoTi Digital-Age Survey Findings



None of the Manheim Township Middle School participants completing the LoTi Digital-Age Survey self-assessed themselves at the Proficient Level as defined by the National Education Technology Standards for Teachers (NETS-T). This level is characterized by the use of digital tools and resources embedded in challenging and engaging learning experiences that promote problem solving, critical thinking, and self-directed learning.

None of the 59 Manheim Township Middle School participants were clustered in Levels 0 through 2. These levels represent the lower portion of the LoTi Framework (see Appendices) and focus primarily on teacher's use of productivity tools, student use of tutorial programs, and "project-based" learning opportunities at the knowledge/comprehension level.

Though 100% of Manheim Township Middle School participants reported having instructional access to digital tools and resources for teacher and student use, approximately 58% of these same participants indicated that they felt fluent in using digital tools and resources in the workplace for student learning.



Approximately 86% of Manheim Township Middle School educators indicated that they either supported or implemented one or more attributes of a learner-centered curriculum. A learner-centered curriculum includes attributes such as a focus on multiple assessment strategies, an emphasis on higher-order thinking skills, and the creation of a problem-based learning environment. Research has found strong links between digital tools and resources used in conjunction with these attributes and higher student achievement based on standardized test scores.

Based on their responses to the LoTi Digital-Age Survey, the highest professional development priority for Manheim Township Middle School participants was in the area of Professional Growth and Leadership; the lowest professional development priority area for Manheim Township Middle School participants was in the area of Digital-Age Learning Experiences and Assessments.



# Digital-Age Goals



Move 39% of the staff member(s) positioned at a Level 2 implementation of technology to a Level 4a during the current school year. This recommendation is based on the relatively high Current Instructional Practices (CIP) scores of these staff members toward a learner-based approach in the classroom and their relatively high Personal Computer Use (PCU) scores.

Move 61% of the staff member(s) positioned at a Level 2 implementation of technology to a Level 3 during the current school year. This recommendation is consistent with these staff members current scores for Current Instructional Practices (CIP) and Personal Computer Use (PCU).

Move 100% of the staff member(s) positioned at a Level 0 implementation of technology to a Level 2 during the current school year. This recommendation is consistent with these staff members current scores for Current Instructional Practices (CIP) and Personal Computer Use (PCU).

Additional goal statements that target other participants at their respective level of technology implementation should be considered based on available financial and personnel resources.



# Digital-Age Recommendations



Consolidate all professional development interventions into a single staff development program based on the five LoTi Digital-Age Professional Development Priority Areas aligned to the NETS-T. This step will provide a common focus for teachers to create individualized professional development plans based on empirically-validated constructs aligned to school or district professional development offerings.

Provide staff development that models specific strategies and techniques for integrating higher-order thinking skills and engaged learning with the available digital tools and resources. This recommendation is targeted at moving participants to Level 3 relating to their level of technology implementation.

Provide staff development that increases participants' confidence and competence with designing LoTi Level 4+ learning experiences using a constructivist, learner-based approach to curriculum planning. This recommendation is targeted at (1) moving participants to a LoTi Level 4a and 4b and (2) improving the perceptions of LoTi Level 4a participants regarding their ability to support or promote authentic, problem-solving learning opportunities.



Review existing districtwide professional development programs in light of the results from this study. Currently, less than 1% of the survey participants self-assessed themselves at Levels 0-2, yet close to 82% of these same participants indicated that they were implementing one or more of the attributes of a learner-centered curriculum. It is respectfully recommended that stakeholders consider new approaches and/or modify existing approaches to districtwide professional development so that educators can make better connections between technology use and student authentic problem-solving in the classroom. This recommendation is targeted at moving lower level survey participants to Level 3.

# Digital-Age Planning



LoTi (Levels of Teaching Innovation) was designed to harness the critical attributes of existing initiatives (e.g., Daggett's Rigor & Relevance, Marzano's Research-based Best Practices, and Wiggins and McTighe's Understanding by Design) into one UNITED EFFORT to improve instruction and maximize student achievement.



## LoTi Online

Professional development online has never been easier! The LoTi Classroom offers:

- ✓ Classes written for the novice online learner.
- ✓ Opportunities for teachers with tight schedules to explore digital-age learning.
- ✓ Highly engaging and enlightening online research-based professional development.
- ✓ Learning by doing; if it can't be applied to your classroom, it is not worth learning.
- ✓ Graduate credit through the University of Delaware.



## LoTi Onsite

Professional development the old-fashioned way... in person! Onsite LoTi sessions include:

- ✓ LoTi Orientation
- ✓ LoTi Administrator Institute
- ✓ LoTi Mentor Certification Institute
- ✓ LoTi 21st Century Makeovers Institute
- ✓ Classroom Walkthroughs
- ✓ Data-driven Decision-making



## LoTi Observer

Classroom walkthroughs are easier than ever on the *iPod touch*®! The LoTi Observer:

- ✓ Provides a powerful system for mobile data collection and analysis of research-based best practice behaviors.
- ✓ Promotes continuous improvement of instructional practices.
- ✓ Uploads walkthrough data online to edit/review/print reports.
- ✓ Effectively gauges levels of teaching innovation on campus.
- ✓ Is ideal for use by building administrators and LoTi Mentors.

# Appendix A: ISTE's NETS for Teachers

NETS-T Standard	Description
Model Digital-Age Work and Learning	<p>Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society. Teachers:</p> <ul style="list-style-type: none"> <li>a. demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.</li> <li>b. collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.</li> <li>c. communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.</li> <li>d. model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.</li> </ul>
Design and Develop Digital-Age Learning Experiences and Assessments	<p>Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS-S. Teachers:</p> <ul style="list-style-type: none"> <li>a. design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.</li> <li>b. develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.</li> <li>c. customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.</li> <li>d. provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.</li> </ul>
Facilitate and Inspire Student Learning and Creativity	<p>Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments. Teachers:</p> <ul style="list-style-type: none"> <li>a. promote, support, and model creative and innovative thinking and inventiveness.</li> <li>b. engage students in exploring real-world issues and solving authentic problems using digital tools and resources.</li> <li>c. promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.</li> <li>d. model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.</li> </ul>



NETS-T Standard	Description
Engage in Professional Growth and Leadership	<p>Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. Teachers:</p> <ul style="list-style-type: none"><li>a. participate in local and global learning communities to explore creative applications of technology to improve student learning.</li><li>b. exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.</li><li>c. evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.</li><li>d. contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.</li></ul>
Promote and Model Digital Citizenship and Responsibility	<p>Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices. Teachers:</p> <ul style="list-style-type: none"><li>a. advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.</li><li>b. address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.</li><li>c. promote and model digital etiquette and responsible social interactions related to the use of technology and information.</li><li>d. develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.</li></ul>



# Appendix B: LoTi Framework

LoTi Level	Description
Level 0: Non-use	<p>At a Level 0 (Non-Use), the instructional focus ranges anywhere from a traditional direct instruction approach to a collaborative student-centered learning environment. The use of research-based best practices may or may not be evident, but those practices do not involve the use of digital tools and resources.</p> <p>The use of digital tools and resources in the classroom is non-existent due to (1) competing priorities (e.g., high stakes testing, highly-structured and rigid curriculum programs), (2) lack of access, or (3) a perception that their use is inappropriate for the instructional setting or student readiness levels. The use of instructional materials is predominately text-based (e.g., student handouts, worksheets).</p>
Level 1: Awareness	<p>At a Level 1 (Awareness), the instructional focus emphasizes information dissemination to students (e.g., lectures, teacher-created multimedia presentations) and supports the lecture/discussion approach to teaching. Teacher questioning and/or student learning typically focuses on lower cognitive skill development (e.g., knowledge, comprehension).</p> <p>Digital tools and resources are either (1) used by the classroom teacher for classroom and/or curriculum management tasks (e.g., taking attendance, using grade book programs, accessing email, retrieving lesson plans from a curriculum management system or the Internet), (2) used by the classroom teacher to embellish or enhance teacher lectures or presentations (e.g., multimedia presentations), and/or (3) used by students (usually unrelated to classroom instructional priorities) as a reward for prior work completed in class.</p>
Level 2: Exploration	<p>At a Level 2 (Exploration) the instructional focus emphasizes content understanding and supports mastery learning and direct instruction. Teacher questioning and/or student learning focuses on lower levels of student cognitive processing (e.g., knowledge, comprehension).</p> <p>Digital tools and resources are used by students for extension activities, enrichment exercises, or information gathering assignments that generally reinforce lower cognitive skill development relating to the content under investigation. There is a pervasive use of student multimedia products, allowing students to present their content understanding in a digital format that may or may not reach beyond the classroom.</p>
Level 3: Infusion	<p>At a Level 3 (Infusion), the instructional focus emphasizes student higher order thinking (i.e., application, analysis, synthesis, evaluation) and engaged learning. Though specific learning activities may or may not be perceived as authentic by the student, instructional emphasis is, nonetheless, placed on higher levels of cognitive processing and in-depth treatment of the content using a variety of thinking skill strategies (e.g., problem-solving, decision-making, reflective thinking, experimentation, scientific inquiry). Teacher-centered strategies including the concept attainment, inductive thinking, and scientific inquiry models of teaching are the norm and guide the types of products generated by students.</p> <p>Digital tools and resources are used by students to carry out teacher-directed tasks that emphasize higher levels of student cognitive processing relating to the content under investigation.</p>



LoTi Level	Description
Level 4a: Integration (Mechanical)	<p>At a Level 4a (Integration: Mechanical) students are engaged in exploring real-world issues and solving authentic problems using digital tools and resources; however, the teacher may experience classroom management (e.g., disciplinary problems, internet delays) or school climate issues (lack of support from colleagues) that restrict full-scale integration. Heavy reliance is placed on prepackaged materials and/or outside resources (e.g., assistance from other colleagues), and/or interventions (e.g., professional development workshops) that aid the teacher in sustaining engaged student problem-solving. Emphasis is placed on applied learning and the constructivist, problem-based models of teaching that require higher levels of student cognitive processing and in-depth examination of the content.</p> <p>Students use of digital tools and resources is inherent and motivated by the drive to answer student-generated questions that dictate the content, process, and products embedded in the learning experience.</p>
Level 4b: Integration (Routine)	<p>At a Level 4b (Integration: Routine) students are fully engaged in exploring real-world issues and solving authentic problems using digital tools and resources. The teacher is within his/her comfort level with promoting an inquiry-based model of teaching that involves students applying their learning to the real world. Emphasis is placed on learner-centered strategies that promote personal goal setting and self-monitoring, student action, and issues resolution that require higher levels of student cognitive processing and in-depth examination of the content.</p> <p>Students use of digital tools and resources is inherent and motivated by the drive to answer student-generated questions that dictate the content, process, and products embedded in the learning experience.</p>
Level 5: Expansion	<p>At a Level 5 (Expansion), collaborations extending beyond the classroom are employed for authentic student problem-solving and issues resolution. Emphasis is placed on learner-centered strategies that promote personal goal setting and self-monitoring, student action, and collaborations with other diverse groups (e.g., another school, different cultures, business establishments, governmental agencies).</p> <p>Students use of digital tools and resources is inherent and motivated by the drive to answer student-generated questions that dictate the content, process, and products embedded in the learning experience. The complexity and sophistication of the digital resources and collaboration tools used in the learning environment are now commensurate with (1) the diversity, inventiveness, and spontaneity of the teacher's experiential-based approach to teaching and learning and (2) the students' level of complex thinking (e.g., analysis, synthesis, evaluation) and in-depth understanding of the content experienced in the classroom.</p>
Level 6: Refinement	<p>At a Level 6 (Refinement), collaborations extending beyond the classroom that promote authentic student problem-solving and issues resolution are the norm. The instructional curriculum is entirely learner-based. The content emerges based on the needs of the learner according to his/her interests, needs, and/or aspirations and is supported by unlimited access to the most current digital applications and infrastructure available.</p> <p>At this level, there is no longer a division between instruction and digital tools and resources in the learning environment. The pervasive use of and access to advanced digital tools and resources provides a seamless medium for information queries, creative problem-solving, student reflection, and/or product development. Students have ready access to and a complete understanding of a vast array of collaboration tools and related resources to accomplish any particular task.</p>

# Appendix C:

## CIP Framework

CIP Level	Description
CIP Intensity Level 0	A CIP Intensity Level 0 indicates that the participant is not involved in a formal classroom setting (e.g., pull-out program).
CIP Intensity Level 1	<p>At a CIP Intensity Level 1, the participant's current instructional practices align exclusively with a subject-matter based approach to teaching and learning. Teaching strategies tend to lean toward lectures and/or teacher-led presentations. The use of curriculum materials aligned to specific content standards serves as the focus for student learning. Learning activities tend to be sequential and uniform for all students. Evaluation techniques focus on traditional measures such as essays, quizzes, short-answers, or true-false questions, but no effort is made to use the results of the assessments to guide instruction.</p> <p>Student projects tend to be teacher-directed in terms of identifying project outcomes as well as requirements for project completion. No effort is made to differentiate instruction. The use of research-based best practices focuses on basic classroom routines (e.g., providing homework and practice, setting objectives and providing feedback, students summarizing and note taking, providing adequate wait time).</p>
CIP Intensity Level 2	<p>At a CIP Intensity Level 2, the participant supports instructional practices consistent with a subject-matter based approach to teaching and learning, but not at the same level of intensity or commitment as a CIP Intensity Level 1. Teaching strategies tend to lean toward lectures and/or teacher-led presentations. The use of curriculum materials aligned to specific content standards serves as the focus for student learning. Learning activities tend to be sequential and uniform for all students. Evaluation techniques focus on traditional measures such as essays, quizzes, short-answers, or true-false questions with the resulting data used to guide instruction.</p> <p>Student projects tend to be teacher-directed in terms of identifying project outcomes as well as requirements for project completion. No effort is made to differentiate instruction. The use of research-based best practices focuses on basic classroom routines (e.g., providing homework and practice, setting objectives and providing feedback, students summarizing and note taking, providing adequate wait time).</p>
CIP Intensity Level 3	<p>At a CIP Intensity Level 3, the participant supports instructional practices aligned somewhat with a subject-matter based approach to teaching and learning?—an approach characterized by sequential and uniform learning activities for all students, teacher-directed presentations, and/or the use of traditional evaluation techniques. However, the participant may also support the use of student-directed projects that provide opportunities for students to determine the "look and feel" of a final product based on their modality strengths, learning styles, or interests.</p> <p>Evaluation techniques continue to focus on traditional measures with the resulting data serving as the basis for curriculum decision-making. The use of research-based best practices expands beyond basic classroom routines (e.g., providing opportunities for non-linguistic representation, offering advanced organizers).</p>
CIP Intensity Level 4	<p>At a CIP Intensity Level 4, the participant may feel comfortable supporting or implementing either a subject-matter or learning-based approach to instruction based on the content being addressed.</p> <p>In a subject-matter based approach, learning activities tend to be sequential, student projects tend to be uniform for all students, the use of lectures and/or teacher-directed presentations are the norm as well as traditional evaluation strategies.</p> <p>In a learner-based approach, learning activities are diversified and based mostly on student questions, the teacher serves more as a co-learner or facilitator in the classroom, student projects are primarily student-directed, and the use of alternative assessment strategies including performance-based assessments, peer reviews, and student reflections are the norm.</p>



CIP Level	Description
CIP Intensity Level 4(cont.)	<p>Although traditional learning activities and evaluation techniques are used, students are also encouraged to contribute to the assessment process when appropriate to the content being addressed. The amount of differentiation is moderate based on the readiness level, interests, and learning styles of the students. The use of research-based best practices expands beyond basic classroom routines (e.g., providing opportunities for non-linguistic representation, offering advanced organizers).</p>
CIP Intensity Level 5	<p>At a CIP Intensity Level 5, the participant's instructional practices tend to lean more toward a learner-based approach. The essential content embedded in the standards emerges based on students "need to know" as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills. The types of learning activities and teaching strategies used in the learning environment are diversified and driven by student questions. Both students and teachers are involved in devising appropriate assessment instruments (e.g., performance-based, journals, peer reviews, self-reflections) by which student performance will be assessed.</p> <p>Although student-directed learning activities and evaluations are the norm, the use of teacher-directed activities (e.g., lectures, presentations, teacher-directed projects) may surface based on the nature of the content being addressed and at the desired level of student cognition. The amount of differentiation is substantial based on the readiness level, interests, and learning styles of the students. The use of research-based best practices delves deeper into complex classroom routines (e.g., students generating and testing hypotheses, implementing cooperative learning, students identifying similarities and differences).</p>
CIP Intensity Level 6	<p>The participant at a CIP Intensity Level 6 supports instructional practices consistent with a learner-based approach, but not at the same level of intensity or commitment as a CIP Intensity Level 7. The essential content embedded in the standards emerges based on students "need to know" as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills. The types of learning activities and teaching strategies used in the learning environment are diversified and driven by student questions.</p> <p>Students, teacher/facilitators, and occasionally parents are all involved in devising appropriate assessment instruments (e.g., performance-based, journals, peer reviews, self-reflections) by which student performance will be assessed. The amount of differentiation is substantial based on the readiness level, interests, and learning styles of the students. The use of research-based best practices delves deeper into complex classroom routines (e.g., students generating and testing hypotheses, implementing cooperative learning, students identifying similarities and differences).</p>
CIP Intensity Level 7	<p>At a CIP Intensity Level 7, the participant's current instructional practices align exclusively with a learner-based approach to teaching and learning. The essential content embedded in the standards emerges based on students "need to know" as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills. The types of learning activities and teaching strategies used in the learning environment are diversified and driven by student questions.</p> <p>Students, teacher/facilitators, and occasionally parents are all involved in devising appropriate assessment instruments (e.g., performance-based, journals, peer reviews, self-reflections) by which student performance will be assessed. The amount of differentiation is seamless since students completely guide the pace and level of their learning. The use of research-based best practices delves deeper into complex classroom routines (e.g., students generating and testing hypotheses, implementing cooperative learning, students identifying similarities and differences).</p>

# Appendix D: PCU Framework

PCU Level	Description
PCU Intensity Level 0	<p>A PCU Intensity Level 0 indicates that the participant does not possess the inclination or skill level to use digital tools and resources for either personal or professional use.</p> <p>Participants at Intensity Level 0 exhibit a general disinterest toward emerging technologies relying more on traditional devices (e.g., use of overhead projectors, chalkboards, paper/pencil activities) than using digital resources for conveying information or classroom management tasks.</p>
PCU Intensity Level 1	<p>A PCU Intensity Level 1 indicates that the participant demonstrates little fluency with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 1 may have a general awareness of various digital tools and media including word processors, spreadsheets, or the internet, but generally are not using them. Participants at this level are generally unaware of copyright issues or current research on the impact of existing and emerging digital tools and resources on student learning.</p>
PCU Intensity Level 2	<p>A PCU Intensity Level 2 indicates that the participant demonstrates little to moderate fluency with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 2 may occasionally browse the internet, use email, or use a word processor program; yet, may not have the confidence or feel comfortable using existing and emerging digital tools beyond classroom management tasks (e.g., grade book, attendance program). Participants at this level are somewhat aware of copyright issues and maintain a cursory understanding of the impact of existing and emerging digital tools and resources on student learning.</p>
PCU Intensity Level 3	<p>A PCU Intensity Level 3 indicates that the participant demonstrates moderate fluency with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 3 may begin to become “regular” users of selected digital-age media and formats (e.g., internet, email, word processor, multimedia) to (1) communicate with students, parents, and peers and (2) model their use in the classroom in support of research and learning. Participants at this level are aware of copyright issues and maintain a moderate understanding of the impact of existing and emerging digital tools and resources on student learning.</p>



PCU Level	Description
PCU Intensity Level 4	<p>A PCU Intensity Level 4 indicates that the participant demonstrates moderate to high fluency with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 4 commonly use a broader range of digital-age media and formats in support of their curriculum and instructional strategies. Participants at this level model the safe, legal, and ethical uses of digital information and technologies and participate in local discussion forums that advocate the positive impact of existing digital tools and resources on student success in the classroom.</p>
PCU Intensity Level 5	<p>A PCU Intensity Level 5 indicates that the participant demonstrates a high fluency level with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 5 are commonly able to use an expanded range of existing and emerging digital-age media and formats in support of their curriculum and instructional strategies. Participants at this level advocate the safe, legal, and ethical uses of digital information and technologies and participate in local and global learning that advocate the positive impact of existing digital tools and resources on student success in the classroom.</p>
PCU Intensity Level 6	<p>A PCU Intensity Level 6 indicates that the participant demonstrates high to extremely high fluency level with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 6 are sophisticated in the use of most, if not all, existing and emerging digital-age media and formats (e.g., multimedia, productivity, desktop publishing, web-based applications). They begin to take on a leadership role as advocates for technology infusion as well as the safe, legal, and ethical uses of digital resources in the schools. Participants at this level continually reflect on the latest research discussing the impact of digital tools on student success.</p>
PCU Intensity Level 7	<p>A PCU Intensity Level 7 indicates that the participant possesses an extremely high fluency level with using digital tools and resources for student learning.</p> <p>Participants at Intensity Level 7 are sophisticated in the use of any existing and emerging digital-age media and formats (e.g., multimedia, productivity, desktop publishing, web-based applications). Participants at this level set the vision for technology infusion based on the latest research and continually seek creative uses of digital tools and resources that impact learning. They actively participate in global learning communities that seek creative uses of digital tools and resources in the classroom.</p>



# Bibliography & Inquiries

## Bibliography

Alvarez, Marino C. (Oct., 1998). Developing critical and imaginative thinking within electronic literacy. NASSP Bulletin, 82(600), 41–7.

Archer, Jeffery. (October, 1, 1998). The link to higher scores. Technology in Schools supplement to Education Week, 28(5).

Flescher, Eric Z. (1997). Discovery and experiential-based learning with computer simulations. University of Kansas. Dissertation Abstracts, 59(04A).

Moersch, Christopher M. (1995). Levels of technology implementation (LoTi): a framework for measuring classroom technology use. Learning & Leading with Technology, 40–42.

Oliver, Kevin Matthew (1999). Student use of computer tools designed to scaffold scientific problem-solving with hypermedia resources: a case study. University of Georgia. Dissertation Abstracts, 60(05A).

Wiburg, Karin M. and Carter, Bruce (Sept. 1994). Thinking with computers. Computing Teacher, 22, 7–10.

## Inquiries

For any further inquiries, please contact LoTi Connection, Inc. by any means listed below or visit the LoTi Connection web site to learn more about the Levels of Teaching Innovation.

*Postal:* LoTi Connection, Inc.  
PO Box 130037  
Carlsbad, CA 92011-0037

*Phone:* 760–431–2232

*Fax:* 760–931–0203

*Web:* [www.loticonnection.com](http://www.loticonnection.com)

